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REPORT

of the

DEPARTMENT

of

AGRICULTURE

for the year

1941

Report of Director of Agriculture, 1941.

The Chairman,

Board of Agriculture.

I. AGRICULTURE IN 1941.

The triple aims of agricultural policy at the present time are firstly to maintain and increase the local production of food; secondly to build up a sound agricultural industry; and thirdly to conserve the value and fertility of the soil.

Progress along the first two lines was badly hindered by most unfavourable weather. The first three months of the year were marred by storms which damaged the crops, and subsequently from April to September there was a drought which for length and intensity was without precedent in the experience of most residents. As a result the spring crops gave a poor yield and summer crops were almost non-existent. Favourable weather set in towards the end of September and there was plenty of rain for the remainder of the year, and too much towards the end. The total rainfall recorded at the Agricultural Station, amounting to 51.62 inches, was not far below the average of 55.27 for the previous ten years, but the poor distribution is shown by the fact that December's rainfall equalled the total for the four summer months of May, June, July and August.

Following the very dry summer there was a plague of caterpillars, cutworms and fireworms of various species, which not only destroyed seedlings in the seed-bed but even wiped out young vegetable crops on a field scale. Such widespread damage has not occurred for a number of years and some association between a dry summer and abundance of these pests seems indicated.

Extreme shortage of farm-help was another serious difficulty which restricted work on farms. Employment on the Defence Bases under construction by the United States Government drew many men who normally work all or part of their time on farms and also caused a significant rise in wages for farm-labour. The possibility of bringing additional help into the country was taken up with the Board of Immigration, and arrangements were made for about a hundred Portuguese from the Azores to come under contract to work for farmers for a period of three years. Most of these arrived during the summer and their coming brought some relief to the farmers.

While bad weather and lack of labour hampered production, there was a larger market for produce in Bermuda than ever before due to a great increase in the population on account of war-time activities. For nine months of the year farmers had little difficulty in selling anything

they could produce, so that for the first time in recent years production was limited not by fear of being unable to sell but by inability to produce. Prices for farm produce in the local market were high throughout the year, and farmers who were fortunate or skilful enough to have produce to sell made good money. Many farmers continued to sell their produce direct to the householder from carts making regular rounds in the thickly populated areas, and the Farmers Market in Hamilton was busier than ever. For three months of the year, production of certain vegetables, principally carrots, onions, and to less extent celery and cabbage, was far above the needs of the local market and the surplus was shipped to Canada and the West Indies so far as shipping permitted. It seems illogical that for the greater part of the year the supply of vegetables should have been inadequate and that for a short period it was found necessary to ship a surplus from our shores. Production is however bound to be greatest at that period, which is the season when certain of the crops mature, and in absence of adequate facilities for storing perishable vegetables under refrigeration, an export outlet is essential if wastage is to be avoided.

The construction of a cold-storage plant on the docks to pre-cool vegetables for export and to store produce for the local market has been planned by the Department for many years but has hitherto been blocked in various ways. During the year, material progress was made with this project; tenders for its construction were received, a contract was awarded to the Bermuda Trading Company representing the Frigidaire Corporation, and a site between No. 6 and No. 7 docks and adjoining the Farmers Market was leased from the Corporation of Hamilton. Construction was started in June and in spite of delays the actual building and part of the insulation were completed by the end of the year. It is hoped to have the plant in running order early in 1942.

Export of Produce. Poor shipping facilities added to the drought and the lack of labour combined to make the exports less in volume than in any previous year of which there is a record. Before the season started, the Dominion Government was asked if, for the duration of the war, it would extend the British Preferential Tariff to produce of Bermuda shipped to Canada via the United States, should the direct service by Canadian vessels prove inadequate. This measure of assistance was agreed to by the Canadian Government and a special order to this effect was passed. As it turned out, during the season under review, advantage was not taken of this privilege, but if shipment becomes more difficult it may prove very helpful. During the shipping-season sailings to Canada were not infrequent and the chief difficulty was that they were erratic and their time of arrival could not be announced beforehand. As a result farmers were given only short notice in which to prepare vegetables for export. In one case indeed the ship had docked before notice of its coming was given so that it sailed with little or no produce although a large volume on the farms was ripe for shipment. In such conditions the value of a cold storage plant on the docks in which produce could be held to await the arrival of a ship is very obvious.

Although the volume of exports showed a decline, higher prices caused the monetary return to be slightly greater than in any of the three previous years. The quantities of produce shipped to various countries during 1941 is given in the following table.

EXPORTS OF AGRICULTURAL PRODUCE, BY COUNTRIES AND ARTICLES.

Commodity	Canada	B. Guiana & B.W.I.	U. S. A.	Total
Beets, bushels	584	192	—	776
Cabbage "	388	1,688	—	2,076
Carrots "	15,411	867	—	16,278
Celery "	7,586	324	—	7,910
Onions "	8,487	5,371	—	13,858
Potatoes "	46	313	—	359
Miscellaneous	56	192	—	248
Total vegetables (bushels)	32,558	8,947	—	41,505
Lily bulbs (cases)	501	2	2,130	2,633
Misc. bulbs (cases)	301	—	13	314
Cut-flowers (boxes)	260	—	19,100	19,360

The total volume of vegetable exports, 41,505 bushels, compares with 74,526 bushels in 1940. All types of vegetables exported showed a decline with the exception of onions which increased by 75%. Exports of lily bulbs doubled in volume and trebled in value. The estimated returns to Bermuda from the sale of agricultural produce are shown in the following table.

Country of Export	Estimated Value of Returns 1939	1940	1941
United Kingdom	£1,100	—	—
Canada	8,300	£13,800	£11,600
British West Indies	500	4,200	3,900
United States of America	9,200	7,600	12,500
	£19,100	£25,600	£28,000

Chief Crops: As in the previous year the onion crop was the most successful of the vegetables. Although the yield and size of the onions were greatly reduced by the drought, the crop did not suffer nearly as much as the more tender vegetables. There was a keen demand both in Canada and the West Indies which resulted in high prices, the average selling-price in Canada being $3.65 per bushel crate. The two potato crops were quite inadequate for local needs, the Triumph crop having been spoilt by heavy winds late in 1940, and the Garnet crop suffering badly from drought. A small quantity of Bermuda-grown Triumph seed, saved over the summer, was planted in September and gave excellent results, yields as high as 8 from 1 being obtained. Of the usual spring and summer vegetables many, including celery, string beans, tomatoes, and water-melons, were almost a complete failure, and others such as beets, cabbage, and carrots gave reduced yields.

The Easter Lily Trade. Easter lilies proved a profitable crop for there was a keen demand for the bulbs both in the United States and Canada. As a result the quantity shipped was slightly greater than in any year since 1932, and satisfactory prices were obtained. With the stoppage of all supplies from Japan there seem excellent prospects for the Easter lily business for some time to come. The sale of Mr. Howard Smith's early-flowering seedling continued to expand. There was also a keen demand, chiefly in Canada, for other bulbs such as paper-white narcissus, freesias, roman hyacinths, and amaryllis, and increased quantities of these were grown and shipped.

It was indeed fortunate that the lily industry was in so strong a position during this year since at the same time it had to sustain a severe blow in the loss of much of the land normally planted with lilies. The lease of land to the United States Government for Defence Bases resulted in a significant reduction in the already limited area of arable land. This affected the lily industry particularly, since more than half the crop was planted in the leased area. Indeed at one time it appeared as if much of the stock would be lost since the area was threatened during the growing-season of the crop. However eventually all the stock was reaped and it is a pleasure to record how considerate the United States base authorities were in ensuring that the crop suffered as little as possible. In the strength of the good prospects for coming years, growers have been encouraged to remove their stocks of bulbs and plant them in other areas so that no serious decline in lily cultivation has resulted.

The Dairy Industry. Dairying, which is a most important branch of farming in Bermuda, passed through a very trying year. Owing to the high incidence of brucellosis or Bang's Disease amongst cattle and the occurrence of a few cases of undulant fever amongst humans, it was decided on the best advice to insist on pasteurisation of all milk offered for sale except that from dairies where the cattle showed freedom from the disease and where the most scrupulous cleanliness was maintained. Regulations along these lines were passed by the Legislature to become effective at the beginning of 1942.

By the end of 1941 there were three pasteurising plants in operation in the central parishes, one starting at the east end, and one planned for the western district. By then a large proportion of the dairymen had made arrangements with one or other of the pasteurisers to handle their milk. In most cases this involved an outright sale of the milk in bulk to the pasteurizer, and the renouncing of a retail business. In some cases this has caused hardship and financial loss to dairymen, particularly to those with only a few cows, and quite a number have been forced out of business. On the other hand, once the difficult transitional period is over, the new system will likely be found to have many advantages. Instead of each dairyman having to produce milk and arrange for its retail distribution, his function will be to produce the milk and supply to the pasteurising-plant in bulk. The retail distribution will be done by the few pasteurisers, thus saving the enormous replication of delivery which formerly occurred. From the view point of sanitation there is no question of the value of compulsory pasteurisation. The main objection, and it is a very real one, is that the processing raises the price of milk by twopence or threepence a bottle, and thus tends to make milk a luxury product for the wealthy and to place it out of the reach of the people who need it most, the people of limited means and large families. A nutritional survey in 1939 showed that

significant proportion of the children of school age suffered from malnutrition of a type which could to large extent be corrected by the increased use of milk. If pasteurisation by increasing the cost is to narrow the circle of milk-consumers it may prove a doubtful gain, and I would strongly urge that, now a milk-supply which is beyond reproach has been obtained, measures be considered for making this supply available to those sections of the community, particularly the children, whose need for it is greatest.

Other Livestock. As a result of the rising prices of imported meat, pig-raising has become more profitable and many more pigs are being kept on the farms. There has also been a demand for veal and beef. Poultry-keeping has declined through uncertainty of the feed-supply, all of which is imported, and through difficulty in obtaining replacements of baby chicks which are usually brought from the United States. The raising of rabbits for food has dropped off also since the start of the war, but is likely to revive rapidly if any shortage of meat occurs.

General Outlook. A survey made shortly before the war showed that little more than half the cultivable land was actually in use, and it is disappointing to find that the position has changed very little after more than two years of war and that we are almost as dependent upon imported foods as ever. Bad seasons, such as the one which is the subject of this report, have predominated since the war and have restricted production, and another thing which has restricted both production and consumption of home-grown supplies has been the fact that up to the end of 1941 no great difficulty had been met in importing any foods that were desired.

This condition seems unlikely to last and it should be possible very materially to increase both the use and the production of home-grown foods. In any move to increase production it has to be kept in mind that a surplus of the perishable vegetables is already grown during part of the year and is shipped abroad. In view of uncertainty of shipping it is desirable not to increase the supply of perishable vegetables in that period, but to produce more during the rest of the year and to concentrate on crops which need not be used immediately but can be stored without too much wastage. A surplus of celery or lettuce at any time may result in heavy loss, whereas a surplus of sweet potatoes or of swedish turnips can be saved and used over a period of time. One crop which, though perishable, may well be extended is the banana for there has been no expansion in the acreage comparable to the increase in population since the start of the war. Greater attention has to be paid to the preservation of perishable produce and to the storage of produce of all kinds. More interest will have to be taken by owners of livestock in growing more feed, in view of probable deficiencies in the imported supply. Increased effort along all of these lines will not only do much to improve the local supply of food but will also be effective in setting the agricultural industry in a sounder position than it has been for some time past.

II. WORK OF THE DEPARTMENT

The following account of work done during the year is summarised from the reports of the officers concerned, which in accordance with instructions are not published in full.

Experimental Work. The unfavourable weather restricted field work to a great extent. Plans were laid for a series of manurial experiments but only a small start could be made. These are designed to test the

importance of organic manures, such as farmyard manure, seaweed, and green manures, and to compare their effects with those of inorganic fertilisers.

A trial was made of the spacing of Triumph potatoes using the normal distance of 22 inches between the rows, but spacing at 9, 12 and 15 inches in the rows. The experiment was made statistically, the three treatments being replicated eight times. The planting grew well save that its life was ended prematurely by a heavy wind about two weeks before the normal span. Under the conditions of the experiment 9-inch spacing gave the greatest yield per row (that is per area of ground) but was closely followed by the 12 inch, the difference not being significant. The yield at 15-inch spacing was significantly less. The yield per barrel of seed planted was almost the same for 12-inch and 15-inch planting, the 9-inch being significantly less. On the basis of this experiment, 12-inch spacing would seem the most suitable for the early crop of potatoes of Bliss Triumph variety.

Varietal tests of several types of vegetables were made. Two varieties of onion, Early Sweet Spanish and Early White Spanish obtained from California, were tested against the standard Yellow Bermuda type. Both proved very nearly as early as Bermuda and yielded about the same. The bulbs were more solid and heavier than the standard type but the keeping-qualities seemed to be poor. A more extensive trial is to be made next season. Two later varieties, Southport Yellow Globe and Early Yellow Globe were stricken by the prevailing drought and failed to make bulbs at all. Of sweet-corn varieties under trial, Spancross was the earliest but it gave smaller ears than Marcross which followed a few days later. Work on the selection of Easter lily seedlings was continued. In a continuation of tests with fodder-plants, a mixture of rye and crimson clover gave good growth during the spring months. Small plantings of elephant and guatemala grass grew well in spite of the drought of summer and may prove useful fodder crops.

Extension Work and Crop Reporting. The state of crops on farms was kept under constant review through frequent visits by officers of the Department, and periodic surveys made by crop-reporters under leadership of the Inspector of Produce. Advice and assistance were given to farmers wherever possible in the course of these visits, and many farmers also brought their problems to the Agricultural Station. Help was given in the valuation of crops and farmland destroyed or threatened by destruction in the work at the Defence Bases.

No agricultural exhibition was held by the Department but assistance was given the Warwick Food Production Committee in their Parish Show held on 17th April, and the Horticulturist gave help at the Flower Show of the Bermuda Garden Club on 26th April. Talks were given by the Director, Plant Pathologist, and Horticulturist to the Garden Club and by the Director to the Pembroke Arbor Society. Frequent articles were written for the Press on agricultural matters and, while local produce was abundant, a weekly column was inserted describing what vegetables were plentiful and how they could best be used. The Plant Pathologist arranged an educational exhibit for the Government museum and also staged an exhibit in Hamilton and St. Georges on the Japanese Beetle with the object of enlisting the public's co-operation in watching for this pest.

Gardens at several of the schools were supervised by the Horticulturist in such time as he could spare from his other duties. A prize for the best school-garden awarded by the Bermuda Garden Club was won by Springhill School in Warwick. A class from the Berkeley Institute visited the Agricultural Station and instruction was given by the Director and Horticulturist. The allotments at Pond Hill, started in 1939 during a period of unemployment, were continued throughout the year but less effort was exerted and smaller interest shown by the planters, for which both the discouraging weather and the great increase in employment were responsible.

Marketing Service. The Agricultural Assistant acted as Marketing Officer and was responsible for promoting the sale of produce in the local market as well as overseas. Local marketing did not offer nearly as many problems as usual since the farmer's main difficulty was to produce the stuff rather than to sell it. However the Department gave what help it could in placing purchasers of produce in touch with those who had it to sell.

The uncertainty of steamship sailings provided the chief problem in marketing abroad. News of the arrival of a ship was passed on by the Department to certain farmers distributed through the various parishes whose duty it was to inform their neighbours so that produce could be prepared for shipment in time. The Department kept in close touch with the representative brokers in Canada and marketing advice was passed on promptly to shippers and growers.

An effort was made to rationalise the marketing of produce in the British West Indies. With the approval of the shippers of produce one firm was appointed in each of the larger islands and in British Guiana to act as representative and sole distributor of produce from Bermuda in the territory. This firm was kept informed of the produce available and the price, and in return it cabled the requirements for each sailing. On receipt of the orders the Marketing Officer allotted them equitably amongst the various shippers and saw that the required quantities went forward. In this way the distributor received the quantities he required, as nearly as these could be supplied, and at an agreed price. This system proved to be an improvement on the previous rather haphazard system of shipping to the West Indies.

Government-Packing and Inspection of Produce. The short notice which was given of the arrival of steamships made centralised packing of vegetables for shipment very difficult, and most of the vegetable exports were packed on the farm. Moreover since the hour of arrival was not precisely given, produce lay too long on the dock on some occasions and spoilage resulted. The Inspector of Produce reports that 1070 crates of vegeables were condemned as unfit for export, but that most on being picked over and re-packed were subsequently passed.

The Government Canning-Plant. The second season's work at the Canning-plant had a very promising start but later was marred when the drought reduced and then stopped the supply of vegetables. Alterations made since the previous year, the installation of a steam-boiler and of a larger sealing-machine and the use of another retort and of a larger brine-tank, proved a great success and resulted in a much greater daily output. A maximum of 2020 cans of beets was packed in a normal working-day.

Cans of No. 2 size were chiefly used but a few cans of No. 5 size were tried experimentally. It was found necessary to cool by water under pressure in order to prevent buckling but otherwise no difficulty was experienced in filling this larger size.

Higher prices for vegetables and higher wages were paid than in the previous year but as a result of the larger daily output the average cost of production showed only a small rise. The total quantity packed was 2233 cases of which carrots and beets accounted for most, with small quantities of white turnips and string beans. The quality of the product received very favourable comment. All the pack was sold by the first week in November, and much more could have been sold. Reimbursements from sales covered the actual running expenses but did not completely cover the purchase of equipment and depreciation on the plant.

As in the previous year we were fortunate to have a visit from Mr. W. S. Macklem of Curtice Bros. Rochester, N. Y. and we remain under a debt of gratitude to him for the valuable help and inspiration he gave. The Horticulturist supervised canning operations during the season and Mrs. Anna Lines was once more in charge of the actual work in the plant. Difficulty was experienced in finding suitable labour and especially in finding men to do the heavy work.

Plant Pathology. The most destructive disease described by the Plant Pathologist in his report was Phytophthora blight of potatoes which ravaged the fields during the last few days of the year and caused very heavy loss. On some farms less spraying than usual had been done, partly because the weather was so wet that there were few days on which spraying was feasible and partly through lack of labour. On farms where the usual routine spraying was done, this proved ineffective against the abnormally heavy onset of blight. Leaf-roll was plentiful in the Bliss Triumph potatoes grown from Long Island seed, as much as 40% being infected, whereas both the seed from Nova Scotia and that from Nova Scotian seed grown once in Bermuda gave much lower counts, around 5%.

Other diseases of minor importance included two bacterial ones, black-rot of broccoli caused by *Xanthosoma campestris* (Pammel) Dowson, and the bacterial spotting of tomato fruits due to *Xanthosoma vesicatoria* (Doidge) Dowson, both of which were encouraged by the continuously wet weather in December. Fungous diseases causing slight damage included a fruit-rot of tomatoes attributed to *Phytophthora parasitica*, a rotting of papaw fruits caused by a species of Gloeosporium, and rot of loquat fruits due to *Glomerella cingulata*.

A Discomycete which appeared on loquat fruit kept in the laboratory has been identified by Prof. H. H. Whetzel as a species of *Lambertella* new to science. The same species has been collected on berries of *Jasminum simplicifolium* at Walsingham, and a third collection on leaves of fiddlewood, *Citharexylum spinosum*, may prove again to be the same. Onion seedlings which appeared unthrifty were found to be affected with *Stemphylium botryosum*, of which the perfect stage (*Pleospora herbarum*) was found after the leaves were kept in a petri dish for a week. *Botryosphaeria Ribis* was recorded as a weak parasite of cassava for the first time in Bermuda, both perfect and imperfect (*Dothiorella*) stages being found. Associated with this fungus was *Diplodia Theobromae* from which however it is quite distinct. Another new record for Bermuda was

Puccinia secalina on a small experimental planting of rye, a clear case of seed transmission. New host records included *Botrytis cinerea* on *Vicia Faba* causing "chocolate spot": *Sclerotinia sclerotiorum* on *Anemone coronaria,* on *Brassica campestris,* and on the weed *Cleome viscosa. Sclerotium rolfsii* was found growing actively on decaying leaves of fiddlewood, *Citharexylum spinosum* on a wooded hillside, the first instance in Bermuda when it has been recorded as a saprophyte and not associated with a cultivated crop. The fungus was isolated and its parasitism to carrot roots proved by inoculation experiments.

In the matter of insect pests, heavy loss of beets, cabbage, lettuce, potatoes, and tomatoes was caused by attack of cutworms and fireworms during the autumn. Other pests were not abnormally destructive. The potato tuber moth (*Phthorimaea operculella*) caused less damage than usual to potatoes, principally because fewer potatoes were stored over the summer than in a normal year. No evidence was obtained that the Japanese Beetle (*Popillia japonica*) has yet obtained a footing in Bermuda, since traps placed at various points throughout the summer failed to make any catch, nor were any specimens reported as having been found on land. Two live beetles were taken on 4th August on a steamship from New York as it came alongside the dock, and another was taken on a steamship from New Jersey which arrived a week later.

Minor pests included the leaf-miner *Agromyza pusilla* damaging seedlings of brassicas during the autumn and the whitefly *Trialeurodes vaporariorum* whose chief hosts were fiddlewood, pigeon-berry (*Duranta repens*) and guava, but which was also seen on a garden rose and on *Myrtus communis.* A beetle found boring in moribund and dead limbs of the poinciana tree, *Delonix regia,* was identified by the Imperial Institute of Entomology as *Xylopsocus capricinus F.* The termite *Kalotermes approximatus* was recorded for the first time as attacking *Bougainvillea spectabilis,* and *Ficus elastica,* and additional records included larvae of *Ligyrus tumulosus* tunnelling the stem of tomato underground, and the scale *Aulacaspis pentagona* on the ornamental plant *Leonotis Leonurus.*

The Plant Pathologist made a profitable trial of mushroom-growing with a white strain of *Agaricus campestris* imported from the United States of America. The compost used was manure from grain-fed horses bedded on pond-shag (*Typha angustifolia*), and yields averaging 1 lb. per square foot were obtained during the winter months. There was a keen demand for the mushrooms and the project attracted much interest and promises to lead to a profitable, if small, local trade.

A small consignment of carrots was treated with Brytene Wax Emulsion 333 B-O and was shipped to Canada. The treated carrots received favourable comment both because they looked better than the untreated controls and also because they showed none of the fungal decay which appeared in unwaxed carrots. Difficulty was experienced through slow drying of the carrots after dipping in wax emulsion in the humid atmosphere of Bermuda, and the Plant Pathologist concludes that if this process is to be used commercially a special drying-machine will be necessary to hasten drying of the waxed carrots.

Veterinary Work. No serious epidemic amongst livestock was recorded by the Government Veterinary Officer during the year. The compulsory testing of dairy cattle for tuberculosis was continued and 1342 cattle were subjected to the test as against 1485 in the previous year. The

reactors numbered 18, showing a decline from 29 in 1940, and the smallest number for several years. Blood-tests for brucellosis showed a high rate of infection amongst dairy cattle, and this resulted in the move by the Public Health Department for the compulsory pasteurisation of milk. It was decided as an agricultural measure to attempt the eradication of this disease, which not only renders milk unsafe, but also seriously affects the productiveness of the herd, and so the profitableness of the industry. Measures recommended by the Department included (1) the slaughter of badly infected cows which are poor milkers or which are difficult to breed, (2) vaccination of calves between the ages of four and eight months and (3) segregation of cows at the time of calving.

In December additional advice was obtained through the visit of Col. Raymond Randall of the Veterinary Corps, U.S. Army. Col. Randall went a stage further in recommending the compulsory vaccination of calves and an embargo on the importation of cattle other than those which had been successfully vaccinated in calfhood. In his valuable report he gave advice also on the pasteurisation and safe handling of milk.

Horticulture. The Horticulturist's programme of work suffered from the unfavourable seasons and the fruit-growing project suffered more than any. The majority of loquat seedlings, which were budded with improved stock late in 1940, died during the dry summer in spite of every effort to save them. Another batch was budded with stock of the varieties Thales and Early Red in the autumn of 1941. Plants of the passion-fruit, *Passiflora edulis*, which were under trial set a great quantity of fruit but this failed to develop as a result of the drought. There seems a likelihood that in a normal summer this fruit will succeed and a number of seedlings is being raised for distribution in the spring of 1942. Propagation of other fruits including guava, cherimoya and sugar apple is proceeding and trials are continuing with several American varieties of grape-vine.

In spite of difficulties of communication, several collections of seeds were received from other parts of the world, particularly acceptable being two collections from Australia given by Sir Brooke Francis K.C. and Mr. Charles Binnie. Several interesting orchids were received from St. Lucia and Trinidad. In the propagation of these and other plants the Department was fortunate to have the services of a skilled propagator whom the fortunes of war have brought to Bermuda.

Experimental work done by the Horticulturist included the propagation of roman hyacinths by slicing the bulbs into four and eight parts, which showed that this method could successfully be used. A trial was made of several gladiolus varieties to determine if these could profitably be used as cut-flowers for shipment to Canada. Poor shipping facilities prevented shipment on a large scale but the small samples which were sent received a good report and sold profitably.

Upkeep of Governmental Grounds. Several successful changes were made in the arrangement of the gardens at Government House and their appearance is noticeably better than it was when the Department of Agriculture took over their care two years ago. Nevertheless they still lag far behind the Agricultural Station in performance and attractiveness and a more adequate staff is necessary before the standard can be raised. A larger appropriation for these grounds has been granted for 1942 and, with a stronger staff, great improvements are to be expected.

Notable progress was made in the Bernard Park at the west end of Pembroke Marsh and it is difficult to recall that this area was an unsightly dump two years ago. Some of the trees and shrubs have made remarkable growth and the park looks very promising. One of the chief difficulties is the wanton destruction to plants and the general untidiness caused by people going through the park. Other grounds owned by Government which were supervised by the Horticulturist included the little park at the Foot-of-the-Lane in Paget, Dellwood School grounds and various playing-fields.

Clerical Work and Publications. The clerical work, which included correspondence on agricultural and departmental matters, the keeping of financial accounts, and the keeping of records in connection with the shipment, marketing, and canning of produce, was effciently performed. Nine numbers of the Agricultural Bulletin containing articles of interest to local farmers and gardeners were written and were distributed in the Colony. Other publications of the Department included an annual report, a list of Food-plants of some Bermuda Insects by the Plant Pathologist, and an elementary Guide for School-Gardens which was written by the Horticulturist for the guidance of school-teachers in charge of gardens.

The Agricultural Station. The ornamental grounds were kept in good order throughout the year, though their appearance during the summer was spoilt by drought and many plants were lost. Owing to shortage of labour no major improvements were undertaken during the year. The experimental plots were fully occupied by vegetables and other crops, most of which were grown for varietal or manurial tests. A small herd of pure-bred Guernsey cattle was maintained at the Station to supply good breeding-stock. The large water-tanks built by the Service Corps in the grounds proved a great boon to many people whose needs they were able to supply during the long drought.

Legislation. The only legislative change affecting the industry which became effective during the year was an amendment to the Byelaws for the Control of Plant Diseases and Pests to prohibit the importation of fruits of the banana and plaintain. Hitherto all parts of the plant except the fruit had been prohibited, but in view of the continued spread and seriousness of the Cercospora Leaf-spot in the West Indian area it was felt that entry of the fruit involved a risk which could no longer be ignored.

Acknowledgements. Grateful thanks are due to many individuals and institutions, too numerous to mention by name, who sent planting-material, publications, or technical advice. I am glad also to record the loyal work of officers of the Department.

T. A. RUSSELL,

Director of Agriculture.

13th February 1942.

Board of Agriculture, 1941.

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Director of Agriculture, T. A. Russell, B.Sc., A.R.C.S., A.I.C.T.A.
Dip. Agr. (Cantab).
Plant Pathologist, J. M. Waterston, B.Sc. (Edin.) A.I.C.T.A.
Agricultural Assistant, W. R. Evans.
Horticulturist, G. R. Groves.
Inspector of Produce, T. Arthur Hollis.
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PART-TIME OFFICERS.

Government Veterinary Officer, C. J. Cooper, V.S.
Assistant Inspector of Produce, C. V. S. Early.